pipe d^3 may be connected to either the exhaust or to the water system of the engine. In either case, it will convey a heating medium to the chamber d, and inasmuch as the heating medium surrounds the greater portion of the chamber c, it will heat the fuel to proper temperature for vaporization. The chamber d has an outlet pipe indicated at d^4. In this case the upper edge of the hemispherical shell d' engages a suitable flange on the casting c' and the shell is held in position by a drain cock d^5 which is screwed onto a tubular member extending downwardly from the chamber c through the chamber d.

At the top of the chamber c is a heat regulating or thermostatic chamber e formed in part by a dish-shaped plate e', the concave portion of which extends downward into or in engagement with the fuel in the upper part of the chamber c and having at its periphery a thickened portion which is seated upon and is secured to a shoulder e^2 at the upper part of the casting c'. This chamber e is closed by an upper diaphragm e^3 formed of a flexible member such as a rather thin sheet metal plate corrugated or otherwise provided with means for giving it flexibility. The diaphragm e^3 is secured in place by screws and by soldering if desired, so that the chamber e will be hermetically sealed. Secured to the diaphragm e^3 and extending upwardly therefrom through a cover plate e^4 for the device C is a post or stud e^5 which is pivotally connected to a lever e^6 arranged outside and above the cover plate e^4 and pivotally connected at one end to lugs e^7 on said cover plate. The lever e^6 is connected at its opposite end to an arm e^8 connected to a butterfly valve e^9, which is arranged in the connection d^3 which supplies the heating medium to the chamber d. The chamber e is adapted to contain a liquid which is more volatile than the fuel in the chamber c. The liquid in this chamber may consist for example of a hydro-carbon of less volatility than the fuel, so that it will volatilize more quickly and at a lower temperature than the fuel. This mechanism just described is so constructed that when the temperature of the liquid in the chamber e rises, a portion of the liquid will be volatilized so as to increase the pressure acting on the diaphragm e^3, and to lift the same and actuate the lever e^6 of the butterfly e^9 so as to close or partially close the latter to lessen or temporarily shut-off the supply of heating medium through the heating chamber d. Also when the temperature of the fuel and consequently of the liquid in the chamber e drops, the valve e^9 will be opened so as to increase the supply of the heating medium and cause a greater heating effect. Thus, it will be seen that the liquid fuel in the chamber c is heated to the predetermined temperature by the heating medium, either hot water or exhaust gases which are supplied to the chamber d around the wall of the fuel chamber c. It will be seen also that the fuel in the chamber c heats the liquid in the regulating chamber e preferably by conduction, inasmuch as the lower wall e' of the chamber is in direct contact with the fuel in the chamber c. By this mechanism the fuel will be heated to practically uniform or constant temperature, regardless of the temperature of the fuel in the tank, and regardless of the temperature of the atmosphere. As the temperature of the fuel falls, or during cold weather, the fuel must be heated a greater amount than in hot weather, and vice versa for warm weather. However, through the regulating mechanism, a greater or less volume of the heating medium is passed through the chamber d per unit of time so as to accomplish this result.

I do not desire to be confined to the exact details nor to the exact arrangement of parts shown, for many modifications may be made without departing from the spirit and scope of my invention. For example, I do not desire to be confined to the arrangement whereby the heating and heat regulating device is between the tank and carbureter for although the present arrangement is preferable, I would consider it within the generic idea of my invention to embody the device in the carbureter itself.

Having thus described my invention, what I claim is:—

1. In a fuel heating and heat regulating device for a fuel feed system of an internal combustion engine, a bowl-shaped fuel chamber having inlet and outlet connections near the top thereof, a heating chamber arranged about the fuel chamber and provided with inlet and outlet connections for a heating medium, a hermetically sealed heat regulating chamber seated in the top of the fuel chamber and provided at the top with a flexible diaphragm, and mechanism connected with said diaphragm for controlling the supply of heating medium to the heating chamber.

2. In a fuel heating and heat regulating device for an internal combustion engine, a bowl-shaped fuel chamber having inlet and outlet connections, a heating chamber surrounding the side and bottom of the fuel chamber having inlet and outlet connections for a heating medium, a third chamber hermetically sealed and provided at the top with a flexible diaphragm, said third chamber being seated in the fuel chamber so that its lower wall will be in engagement with the fuel in said fuel chamber, a valve in the connection leading to the heating chamber, and mechanism connected to said diaphragm for actuating the valve.